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## The World Above 50 MHz

# The Phenomenon of 6-Meter TEP

After 20 years of HF operating from Long Island, New York, I looked at the 6-meter band as a new challenge. I bought a used Swan 250 6-meter transceiver just prior to the September 1990 ARRL VHF contest, and I hooked it into an old TV antenna mounted on a pole in my backyard. I proceeded to work two dozen northeast US stations via line of sight.

The morning prior to the June 1991 VHF contest is when I really discovered the magic of 6 meters, working stations via skip into North Carolina and Florida. I then made another two dozen contacts via this sporadic-E skip during the contest. There were more sporadic-E openings that summer, and that fall, I experienced 6-meter F2-layer activity when I worked Central American countries on SSB and CW. I experienced more F2 in January 1992 when I made contacts with those in western Europe and the US West Coast, and I even worked aurora in May!

These events led me to learn all I could about 6 meters, other VHF bands, and the different propagation modes. In time, I would give talks at local radio clubs and write the book *Six Meters: A Guide to the Magic Band* in 1994 for Worldradio. It is with this background that I take on the challenge of writing "The World Above 50 MHz," to help all hams who enter this unique spectrum of the hobby. Please send any reports of interest for this column to **ken.neubeck@gmail.com**. For every month that I write this column, I will also give VHF propagation outlook tables (see Tables 1 and 2) detailing conditions that North American operators can expect.

## General TEP Traits

Of the three 6-meter propagation modes, transequatorial propagation (TEP) is the most likely to occur in April and into May for paths between North and South America, or between Europe and southern Africa for paths over the geomagnetic equator. TEP can occur during moderate-to-high solar activity and around the spring and autumn equinoxes. This is an F-layer propagation, in which the F-layer area centered over the geomagnetic equator is sufficiently ionized to transport radio waves. It acts like a duct on 6 meters; signal paths from parts of South America enter this duct and exit into the southern US, as well as in parts of Europe and into South Africa. This is one of the primary 6-meter propagation modes for stations in South Africa, as the area has a low yearly incidence of sporadic-E propagation.

This mode occurs generally in the late afternoon, and there can be some noticeable distortion on SSB signals. I've worked Damon, KJ4E, in central Florida a lot on 6 meters. In 2025, he experienced TEP beginning on April 11, and he worked LU7VFF in Argentina on SSB at around 5:55 PM local time. He worked more stations in Argentina via TEP during the first week of May. A simple example of this TEP path is shown in Figure 1.

**Table 1 — April 2026 VHF 6-Meter Propagation (North America)**

| Propagation Mode | Rate of Occurrence |
|---|---|
| Sporadic E | Spotty at best — two to four occurrences |
| Aurora | If major geomagnetic event occurs |
| Transequatorial | Occasional for certain US locations |

**Table 2 — April 2026 VHF 2-Meter Propagation (North America)**

| Propagation Mode | Rate of Occurrence |
|---|---|
| Tropospheric | Spotty for certain US locations (east, Central Valley, Gulf area, and West Coast) |

## TEP with Sporadic E

The F-layer TEP duct between Argentina and southern Florida covers 4,500 miles. However, it is possible for stations farther north to work into Argentina when there is a sporadic-E link connecting northern US stations to southern states (such as Florida) at the same time as the TEP event.

I have experienced this a few times during May. One such event happened on May 12, 2014 (see Figure 2,

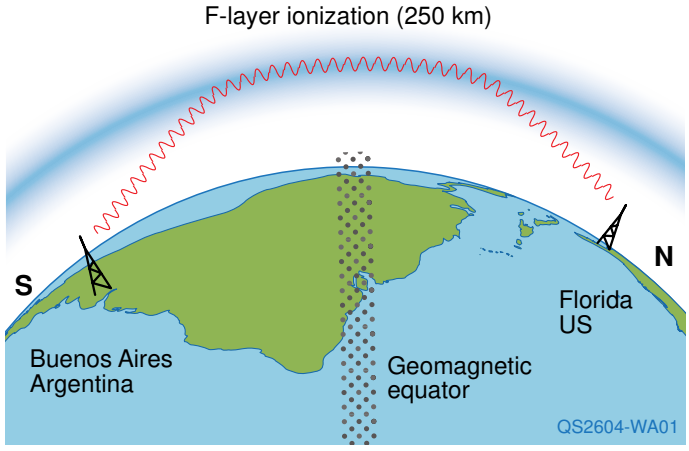


**Figure 1** — The TEP path in the ionized F layer over the geomagnetic equator. This allows 6-meter signal paths between Argentina and the southern US.

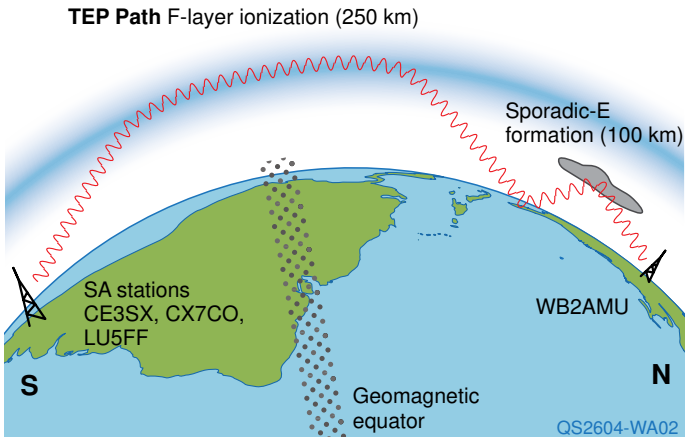


**Figure 2** — The TEP/sporadic-E combination that occasionally allows stations in the northern US to connect to a TEP event with a sporadic-E link.

which shows the basic TEP duct plus the sporadic-E link). In this opening, I worked three different stations in three different countries over the course of 30 minutes (see Figure 3). It is interesting to note that the width of the sporadic-E formation (located in the US) is projected toward this area in South America. While solar flux values for 2014 were not high for F2 propagation, there was sufficient F-layer activity over the geomagnetic equator for TEP paths.

Other parts of the US, such as the Midwest or the West, can get into South America via the TEP and sporadic-E combination, with the basic TEP path landing in southern states (such as Texas) at around 25 – 35 degrees north latitude.

Throughout Solar Cycle 25, many 6-meter TEP or TEP/sporadic-E contacts have been conducted via 50.313 MHz FT8, particularly when the signals are weak. Contacts compiled on a DX cluster show that Tim, WW1L, in Maine and Ron, WZ1V, in Connecticut worked Javi, LU5FF, in April 2025 via combined TEP and sporadic E on FT8. Signal strength ranged from –7 to –21 dB, which is below CW and SSB levels.

There may be confusion as to whether the contacts were a result of TEP or a north-south F2 path, which can occur during months of high solar activity. The primary clue is that north-south F2 paths may take place during late morning and early afternoon, whereas TEP tends to occur only in late afternoon. For example, I observed north-south paths the day after the major October 11 aurora openings, when I worked stations in Argentina as early as noon.

The sunspots have been appearing erratically as of late, but April and May should be good months for monitoring TEP. There is also a fall season for TEP

**Figure 3** — The stations in South America that I worked from Long Island, New York (grid FN30), during late afternoon on May 12, 2014, via the combined TEP/sporadic-E link.

activity, so late September into October 2026 will present potential opportunities as well.

## January 2026 Aurora Event

An Earth-directed X1.9 coronal mass ejection happened on January 18, 2026. It impacted Earth's magnetic field late on January 19, inducing significant VHF aurora propagation. Europe and North America were affected in the evenings on January 19 and 20; many stations in the northeast US, such as Michael, N2VJ; Doug, K1DG; Victor, VA2WA, and myself, worked stations via distorted 6-meter CW. Activity reached up to 220 MHz on January 19, with David, K1WHS, in Maine working as far west as Joseph, K9MRI, in Indiana and Jonathan, WØZQ, in Minnesota.

When aurora activity faded on January 20, a terrific event occurred at 0000 UTC the next day, when there was major F2-layer activity on 6 meters, and stations in the US and Canada worked those in the Caribbean on CW, SSB, and FT8 for more than 4 hours. I and others worked Puerto Rico, Trinidad and Tobago, Curaçao, and a very loud Charlie, TI5CDA, in Costa Rica. Damon, KJ4E, in central Florida, worked 19 stations in 13 different countries. The KP5/NP3VI Desecheo Island DXpedition team worked 500 North American stations via FT8 for a new DX country on 6 meters!